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BY THE U.S. GENERAL ACCOUNTING OFFICE

COMPLETED
22

Report To The Postmaster General

ORIGINAL

Potential Savings From Diverting Certain Mail From Air To Surface Transportation

Working with the Postal Service, GAO identified a methodology to divert mail that is transported by air to surface transportation. By diverting short-haul, high-cost mail that is transported via air to surface transportation, the Postal Service can save millions of dollars annually.

GAO/GGD-82-63
JUNE 18, 1982

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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

GENERAL GOVERNMENT
DIVISION

B-207489

The Honorable William F. Bolger
Postmaster General

Dear Mr. Bolger:

During the past year we have been analyzing the Postal Service's national transportation/distribution system and working with Postal Service staff to determine whether the Service could convert short-haul, high-cost mail that is transported via air to surface transportation. We found that by diverting some of this high-cost mail, the Postal Service can save millions of dollars annually.

The objectives of this project were twofold:

(1) To develop a methodology for the analysis and potential conversion of mail to more economical and timely transportation systems. (See app. I.)

(2) To test the methodology's validity in a variety of markets and determine potential savings and/or service improvements.

Our interest in developing this methodology was stimulated in part by the results of the Postal Service's Central Region's Highway Air Program (HAP). The HAP's purpose was to achieve improved mail service in certain locations using surface transportation to haul mail that previously was transported by air. The program demonstrated that mail can be diverted from air to surface transportation over short distances. At the same time, current levels of service were improved and costs were reduced.

Transportation costs can be reduced as the Postal Service continues diverting mail nationwide from air to surface transportation. Using the transportation planning methodology, which we developed jointly with the Postal Service, we identified 54 routes throughout the Nation (less than 500 miles apart) where we believe mail costs can be significantly reduced if the Postal Service diverts the mail to surface rather than air transportation. Currently, the Postal Service is spending about $72 million annually to move mail by air along the 54 routes. Appendix II to this report provides a list of the 54 routes we identified, including the markets involved, and the current cost of air transportation.

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After we initially briefed Western Region officials on the specifics of the methodology, they agreed to study the feasibility of shifting from air to surface transportation. In June 1981 these officials confirmed that transportation costs could be reduced and service standards still protected if mail was diverted to surface transportation. The region evaluated output from the methodology in selected California markets and found that over $600,000 could be saved in a 4-week period.

This market area, which is part of one of the 54 areas we identified in our review, exemplifies the potential for savings. The Service needs to examine the other 53 markets (app. II) to determine the extent to which the markets can be converted to surface transportation. The impact on current levels of service for the 54 markets will have to be tailored to local circumstances. On the basis of data for the first two quarters of fiscal year 1982, the Postal Service estimates that it will fly about 80 million fewer pounds of mail in the 500-mile markets than it did in fiscal year 1981.

In September 1981, the Postal Service asked all its regions to, among other things, identify mail which could be transported by surface instead of air transportation and still meet current levels of service. The methodology we developed with the assistance of your staff will provide the regions the tools needed to identify those air routes for which conversions will result in increased service and reduced costs.

In addition to the air to surface transportation conversions, the methodology can also be applied to other transportation/distribution activities. These include

--consolidating and reducing the number of highway contract and motor vehicle routes and

--reducing the number and capacity of vehicles needed to move the mail.

CONCLUSIONS AND RECOMMENDATIONS TO THE POSTMASTER GENERAL

Working with the Postal Service, we have identified a methodology to divert mail that is transported by air to surface transportation. If this methodology is systematically adopted nationwide and tailored to local circumstances, we believe it will identify routes where significant savings can be effected. The Postal Service estimates that 80 million pounds of mail flown within the 500-mile markets will be diverted to surface transportation in fiscal year 1982.

We recommend that the Postal Service systematically adopt this methodology nationwide to determine which routes can be

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diverted to surface transportation and result in savings of millions of dollars annually. The Postal Service should also consider using this methodology for the other previously identified transportation/distribution activities to gain additional cost reductions and improved service.

AGENCY COMMENTS

The Postmaster General, in commenting on our draft report, agreed that the jointly developed methodology will help cut costs by identifying routes where mail can be shifted from air to surface transportation without adversely affecting current levels of service. He further stated that the Service had taken steps to implement the methodology on a national basis, including acquiring a computerized model. (See app. III.)

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Copies of this report are being sent to the Chairmen, House Committee on Post Office and Civil Service, Senate Committee on Governmental Affairs, House Committee on Government Operations, and the House and Senate Committees on Appropriations.

As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement of actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations within 60 days of the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We would like to emphasize the spirit of cooperation that has been the framework during this project. We and the Postal Service are both working toward and share the same objectives of reducing costs and improving mail service. We would be interested to know of actions taken in response to our recommendations.

Sincerely yours,

W. J. Anderson

William J. Anderson
Director

Transportation Planning Methodology

Steps 1 to 10 below describe, step by step, a methodology for air to surface transportation conversions. With minor variations this methodology can be applied to other transportation/distribution activities. These include

--consolidating and reducing the number of highway contract and motor vehicle routes and

--reducing the number and capacity of vehicles needed to move the mail.

1. Select the latest complete fiscal year's air payment data that reflect information as follows:

   Origin Air Mail Facility (AMF)
   Final destination Air Mail Facility
   Pounds flown
   Cost

   This information should include both loose sack and container data. The data should not include airport transfer data.

2. Eliminate from consideration any market pairs where $50,000 or less was expended, or, any market pairs that are greater than 500 great circle miles apart.

   Note 1: When applying this methodology at the local level, a much lower dollar threshold can be used because of the reduced number of points in the analysis.

   Note 2: In most cases, 500 great circle miles will equal 550 or more surface miles. Surface distances that exceed 550 miles should not automatically disqualify the route from further analysis. Other factors which will influence this decision are:

   - Outgoing clearance time
   - Critical entry time (the latest time transportation can arrive at destination post office and still ensure the processing of a particular class of mail to meet the service commitment)
   - Travel time
   - Road conditions
   - Number of transfer points
   - Actual dispatch time needed to ensure overnight delivery of mail tendered early in the day (current levels of service).

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3. Plot data representing mail volumes as shown on page 4 for your local area to develop potential routes.

4. Calculate the highway breakeven cost comparison and eliminate those markets which, when linked together, cannot achieve the breakeven point or better.

   Surface costs are calculated as follows:

$0.90	Per vehicle mile
X _____	Number of round trip miles*
=	Cost per day
X 312	Days of trip operation/year
=	Total estimated annual cost

   Thus the breakeven point can be determined by subtracting the highway cost from the air cost. If the highway cost is smaller than the air cost, the breakeven point has been achieved and it becomes cost effective to move mail on the ground.

   *Surface mileage between markets can be obtained from the Household Movers Guide or from any mileage and driving time map such as Rand McNally & Company produces.

5. Caution should be exercised so that trucks are not loaded beyond capacity. A 45 foot tractor trailer (TT) can haul 8,167,775 lbs. of mail per year or 26,178 lbs. of mail per trip based on the following facts and calculations.

   Facts: One cubic foot of first class mail weighs 15.4 lbs.
   One All Purpose Container (APC) can hold 47.22 cubic feet of mail.
   36 APC's can be loaded on one 45-foot TT.

   Therefore:

	15.4	lbs.
	X 47.22	cubic feet
=	727.188	lbs. per APC
	X 36	APC's
=	26,178.768	lbs. per 45' TT per trip
	X 312	days per year
=	8,167,775.6	lbs. per 45' TT per year

6. Travel time is estimated at a continuous rate of speed of 35 miles per hour. Compute the total elapsed travel time by dividing 35 mph into the total mileage.

7. Add the total elapsed travel time to the actual time overnight mail is ready for dispatch at the origin AMF. This will determine the estimated arrival time at the designating AMF.

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8. Compare the estimated arrival time at the destinating AMF to the inbound critical entry time for the destinating AMF.

   If the arrival time is after the critical entry time, add 24 hours to determine the service level for delivery of the mail.

9. Evaluate Letter Sorting Machine (LSM) utilization to determine what in plant staffing schedules can be modified to accommodate new arrival profiles and maintain current levels of service.

10. Determine what routes and capacity exist within the current National Surface System to move this mail and maintain current levels of service.

Examples of how this methodology can be applied are contained on the following pages. An exhibit showing the South Central United States has been constructed to help add clarity to the route analysis. (See exhibit 1.)

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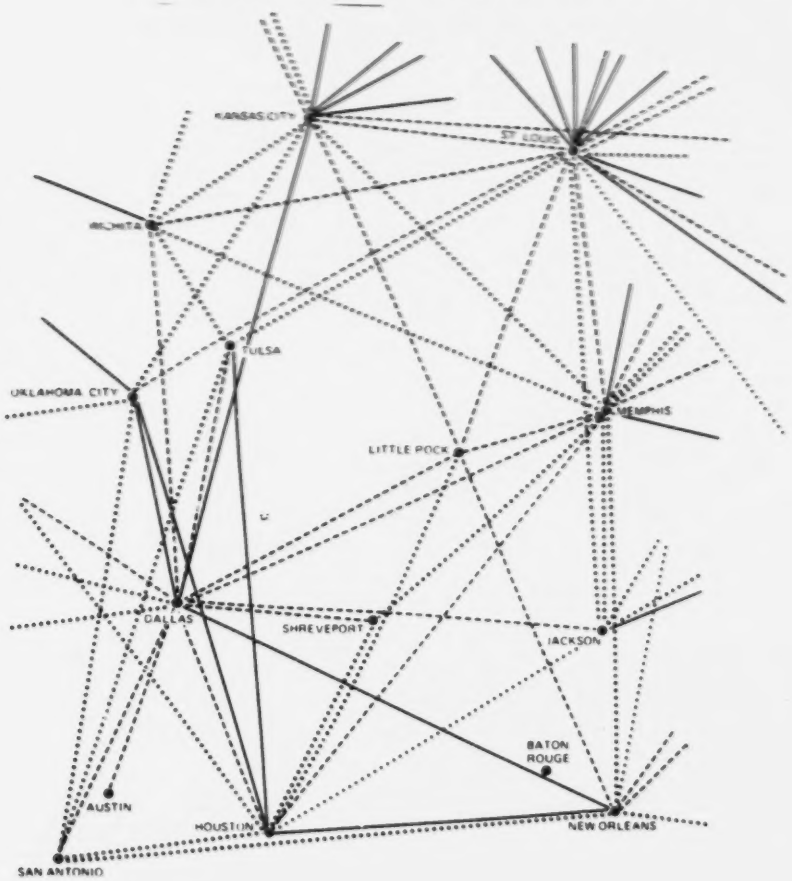
APPENDIX I

Exhibit 1

MAIL FLOWS IN THE SOUTH CENTRAL U.S.



VOLUME	SYMBOL	COST PER YEAR TO FLY MAIL
LARGE	———	$225,000 and over
MEDIUM	- - - - - -	$100,000 224,999
SMALL	. . . . .	$60,000 99,999

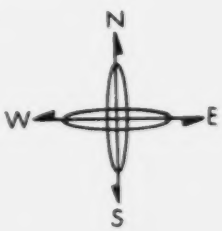


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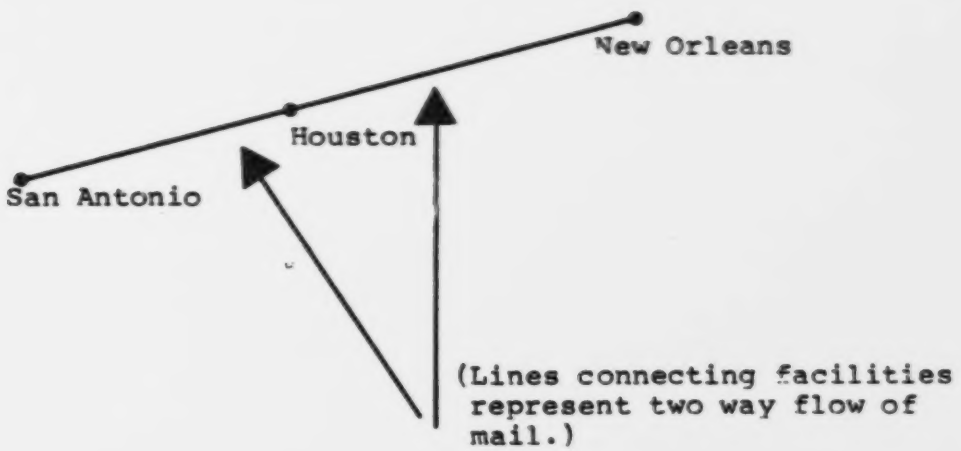
Exhibit 2

An example of how ground mail facilities can be connected by surface transportation to move mail currently flown:

Route Configuration



These three facilities can be connected in a point-to-point route basically following a single axis. The following two way mail volumes plotted in exhibit 1 can be moved on this route:

New Orleans and Houston
New Orleans and San Antonio
Houston and San Antonio

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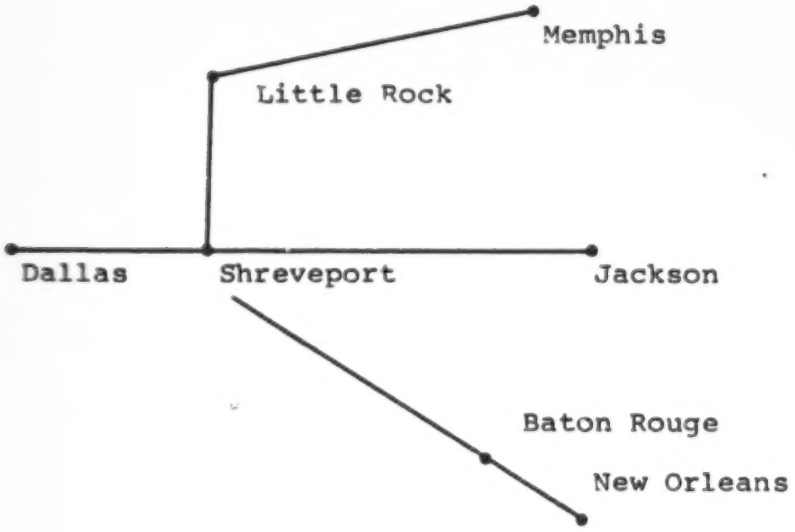
Exhibit 3

A second example of how ground mail facilities can be connected by surface transportation to move mail currently flown:

Route Configuration



These facilities can be connected in a hub and spoke configuration using Shreveport as the hub or transfer point. Jackson, New Orleans, and Dallas have direct highway connection into Shreveport, whereas Memphis has one intermediate stop at Little Rock before arriving at Shreveport. The following two way mail volumes plotted in exhibit 1 can be moved on this hub and spoke operation:

Memphis and Little Rock	Little Rock and New Orleans
Memphis and Jackson	Little Rock and Dallas
Memphis and New Orleans	Jackson and Dallas
Memphis and Shreveport	New Orleans and Dallas
Memphis and Dallas	Shreveport and Dallas

According to the Postal Service, $800,000 can be saved annually by connecting Baton Rouge, Shreveport, and Dallas with a highway contract route in lieu of air transportation while still maintaining existing service.

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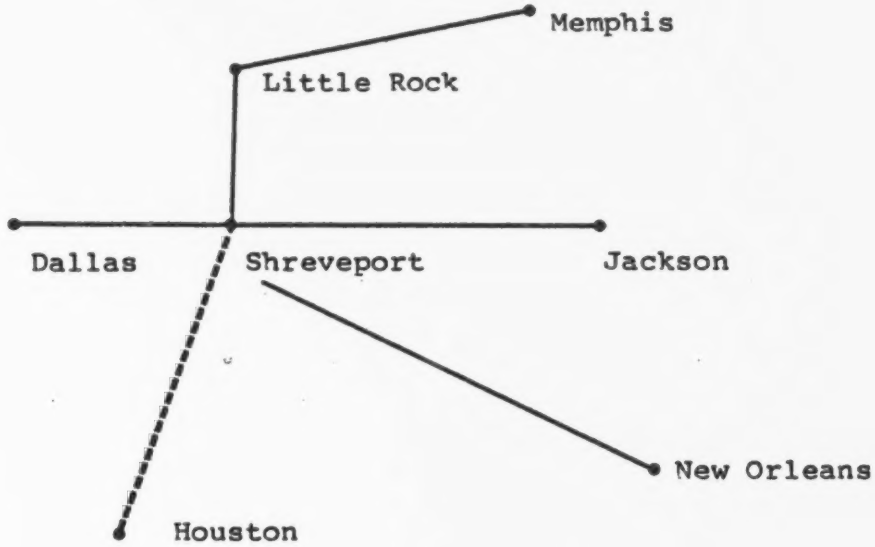
Exhibit 4

An alternative route design with Houston added showing how ground mail facilities can be connected by surface transportation to move mail currently flown:

Alternative Route Configuration



Houston can be added to the hub and spoke configuration of exhibit 3 or left with the route shown in exhibit 2. This demonstrates the flexibility available to the field when applying this methodology to local circumstances. The following two way mail volumes plotted in exhibit 1 can be moved on this hub and spoke operation:

Memphis and Little Rock
Memphis and Jackson
Memphis and New Orleans
Memphis and Shreveport
Memphis and Dallas
Memphis and Houston
Little Rock and New Orleans
Little Rock and Dallas
Little Rock and Houston
Jackson and Dallas
Jackson and Houston
New Orleans and Dallas
New Orleans and Houston
Shreveport and Dallas
Shreveport and Houston

When Houston is combined with exhibit 3, a new route configuration as shown in exhibit 4 is formed and the greatest potential for cost savings exists because of the following factors:

--Houston is about 100 miles closer to Shreveport than to New Orleans.

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APPENDIX I

--By moving Houston to exhibit 4, three small, two way mail volumes moving between Little Rock and Houston, Jackson and Houston, and Shreveport and Houston are picked up with the addition of a medium mail volume moving between Memphis and Houston and a large mail volume moving between New Orleans and Houston. (See exhibit 1.) However, two small mail volumes moving between New Orleans and San Antonio, and Houston and San Antonio are not included because distances are too great between San Antonio and Shreveport.

--Highway transportation exists between New Orleans and Shreveport in exhibit 4. Mail from Houston will not increase cost over this segment or any other segment from exhibit 3 because it will piggyback on existing transportation.

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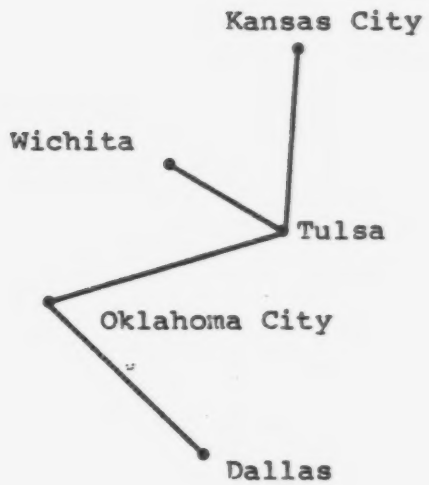
Exhibit 5

An example of how ground mail facilities can be connected by surface transportation to move mail currently flown:

Route Configuration



Tulsa, Oklahoma City, and Dallas are linked together. Tulsa serves as a transfer point for mail interaction with Kansas City on one axis and Wichita on another axis. The following two way mail volumes plotted in exhibit 1 can be moved on this route:

Kansas City and Wichita
Kansas City and Oklahoma City
Kansas City and Dallas
Wichita and Tulsa
Wichita and Dallas
Oklahoma City and Dallas
Tulsa and Dallas

If distances are determined by local transportation managers to be too great to include Kansas City, it can be dropped from this route. This demonstrates the flexibility of the methodology and how field managers can evaluate and construct routes to meet local conditions.

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APPENDIX II

Route Configuration Including Market Entities to be Served by Surface Routes When Diverting Short-haul Air Transportation Links to Surface Transportation

Using the transportation planning methodology which we developed jointly with the Postal Service, we identified 54 routes throughout the Nation (less than 500 miles apart) where mail costs can be reduced if the Postal Service diverts the mail to surface rather than air transportation. The route configurations below represent cities that are less than 500 miles apart and that are connected by two way mail flow. When the same two markets appeared in more than one route, the air costs were only computed once.

Route configuration	Market designation (note a)	Market entities to be served by surface routes	Computed air cost
1	T	Los Angeles, CA	$7,338,535
	H	Fresno, CA	
	I	San Jose, CA	
	T	Sacramento, CA	
	T	San Francisco, CA	
2	T	Boston, MA	6,255,852
	T	Hartford, CN	
	I	Providence, RI	
	H	Newark, NJ	
	T	New York, NY (LGA)	
	T	New York, NY (JFK)	
	I	Philadelphia, PA	
	I	Baltimore, MD	
	T	Washington, DC (IAD)	
	I	Washington, DC (DCA)	
3	I	Washington, DC (DCA)	4,220,010
	T	Baltimore, MD	
	H	Pittsburgh, PA	
	I	Cleveland, OH	
	I	Harrisburg, PA	
	T	Philadelphia, PA	
	T	Detroit, MI	
4	T	New York, NY (JFK)	3,462,433
	T	New York, NY (LGA)	
	I	Newark, NJ	
	I	Cleveland, OH	
	T	Detroit, MI	

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APPENDIX II

Route configuration	Market designation (note a)	Market entities to be served by surface routes	Computed air cost
5	T	New York, NY (JFK)	$3,186,956
	T	New York, NY (LGA)	
	H	Newark, NJ	
	I	Philadelphia, PA	
	T	Baltimore, MD	
	T	Washington, DC (IAD)	
	I	Washington, DC (DCA)	
	I	Richmond, VA	
	I	Durham, NC	
	I	Greensboro, NC	
	T	Charlotte, NC	
	T	Roanoke, VA	
6	I	Washington, DC (DCA)	2,655,292
	T	Washington, DC (IAD)	
	T	Baltimore, MD	
	I	Greensboro, NC	
	I	Charlotte, NC	
	T	Atlanta, GA	
	T	Roanoke, VA	
7	I	Washington, DC (DCA)	2,577,018
	T	Baltimore, MD	
	I	Pittsburgh, PA	
	I	Columbus, OH	
	H	Dayton, OH	
	I	Cincinnati, OH	
	T	Louisville, KY	
	T	Indianapolis, IN	
8	T	Seattle, WA	2,578,934
	I	Yakima, WA	
	I	Pasco, WA	
	T	Boise, ID	
	T	Portland, OR	
	T	Spokane, WA	
	H	Pendleton, OR	
9	T	Milwaukee, WI	2,159,773
	I	Chicago, IL	
	I	Peoria, IL	
	I	St. Louis, MO	
	T	Kansas City, MO	
10	T	New York, NY (JFK)	2,018,631
	T	New York, NY (LGA)	
	H	Newark, NJ	
	I	Philadelphia, PA	
	I	Harrisburg, PA	
	I	Pittsburgh, PA	
	T	Columbus, OH	

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APPENDIX II

Route configuration	Market designation (note a)	Market entities to be served by surface routes	Computed air cost
11	T	Minneapolis, MN	$1,911,486
	T	Kansas City, MO	
	H	Des Moines, IA	
	T	Omaha, NE	
	T	St. Louis, MO	
12	T	Minneapolis, MN	1,683,698
	I	Madison, WI	
	I	Milwaukee, WI	
	T	Chicago, IL	
13	T	Omaha, NE	1,479,106
	I	Des Moines, IA	
	I	Cedar Rapids, IA	
	I	Moline, IL	
	I	Chicago, IL	
	T	Milwaukee, WI	
14	T	Dallas, TX	1,687,242
	I	Oklahoma City, OK	
	H	Tulsa, OK	
	T	Wichita, KS	
	T	Kansas City, MO	
15	T	Buffalo, NY	1,490,912
	I	Toronto, Canada	
	I	Detroit, MI	
	I	Kalamazoo, MI	
	T	Chicago, IL	
16	T	Louisville, KY	1,368,806
	I	Indianapolis, IN	
	H	Chicago, IL	
	T	Milwaukee, WI	
17	T	Pittsburgh, PA	1,295,593
	I	Cleveland, OH	
	I	Fort Wayne, IN	
	H	Chicago, IL	
	T	Milwaukee, WI	
18	T	Dallas, TX	1,599,048
	H	Shreveport, LA	
	T	New Orleans, LA	
	T	Jackson, MS	
	I	Little Rock, AR	
	T	Memphis, TN	

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APPENDIX II

Route configuration	Market designation (note a)	Market entities to be served by surface routes	Computed air cost
19	T	Milwaukee, WI	$1,249,890
	H	Chicago, IL	
	I	Champaign, IL	
	T	Nashville, TN	
	T	Memphis, TN	
	H	Cairo, TN	
20	T	San Diego, CA	1,265,510
	T	Sacramento, CA	
	I	Los Angeles, CA	
	T	San Francisco, CA	
	H	Fresno, CA	
21	T	Milwaukee, WI	1,064,516
	H	Chicago, IL	
	I	Cincinnati, OH	
	T	Columbus, OH	
22	T	Atlanta, GA	1,111,242
	I	Jacksonville, FL	
	I	Orlando, FL	
	T	Tampa, FL	
23	T	Los Angeles, CA	1,074,480
	T	San Diego, CA	
	I	Phoenix, AZ	
	T	Tucson, AZ	
	H	Palm Springs, CA	
24	T	Memphis, TN	1,253,726
	T	Jackson, MS	
	T	New Orleans, LA	
	H	Birmingham, AL	
	T	Atlanta, GA	
25	T	St. Louis, MO	1,029,550
	I	Indianapolis, IN	
	T	Cleveland, OH	
	T	Detroit, MI	
	H	Toledo, OH	
26	T	Salt Lake City, UT	923,710
	I	Grand Junction, CO	
	T	Denver, CO	

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APPENDIX II

Route configuration	Market designation (note a)	Market entities to be served by surface routes	Computed air cost
27	T	Boston, MA	$ 856,416
	I	Albany, NY	
	I	Syracuse, NY	
	I	Rochester, NY	
	I	Buffalo, NY	
	T	Toronto, Canada	
28	T	New York, NY (JFK)	817,321
	T	New York, NY (LGA)	
	H	Newark, NJ	
	I	Syracuse, NY	
	I	Rochester, NY	
	I	Buffalo, NY	
	T	Toronto, Canada	
29	T	Washington, DC (DCA)	883,239
	I	Philadelphia, PA	
	I	Syracuse, NY	
	I	Rochester, NY	
	I	Buffalo, NY	
	T	Toronto, Canada	
30	T	Atlanta, GA	901,519
	I	Louisville, KY	
	H	Cincinnati, OH	
	T	Indianapolis, IN	
	T	Dayton, OH	
31	T	Miami, FL	907,980
	I	Fort Lauderdale, FL	
	I	West Palm Beach, FL	
	H	Tampa, FL	
	T	Tallahassee, FL	
	T	Jacksonville, FL	
32	T	Detroit, MI	750,149
	I	Cincinnati, OH	
	I	Louisville, KY	
	T	Nashville, TN	
33	T	St. Louis, MO	713,042
	I	Nashville, TN	
	T	Atlanta, GA	
34	T	Houston, TX	687,582
	I	Dallas, TX	
	I	Oklahoma City, OK	
	T	Tulsa, OK	

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Route configuration	Market designation (note a)	Market entities to be served by surface routes	Computed air cost
35	T	Albany, NY	$ 536,003
	T	New York, NY (JFK)	
	H	Newark, NJ	
	I	Philadelphia, PA	
	I	Baltimore, MD	
	T	Washington, DC (DCA)	
36	T	Atlanta, GA	600,040
	I	Greenville, SC	
	I	Charlotte, NC	
	I	Raleigh, NC	
	T	Richmond, VA	
37	T	Boston, MA	650,325
	I	Hartford, CN	
	T	Pittsburgh, PA	
38	T	Philadelphia, PA	620,651
	I	Columbus, OH	
	I	Dayton, OH	
	T	Cincinnati, OH	
39	T	Indianapolis, IN	529,422
	I	St. Louis, MO	
	T	Memphis, TN	
40	T	Los Angeles, CA	379,389
	T	Las Vegas, NV	
41	T	San Francisco, CA	341,311
	I	Sacramento, CA	
	T	Reno, NV	
42	T	Washington, DC (DCA)	239,629
	I	Boston, MA	
	T	Portland, ME	
43	T	Atlanta, GA	548,068
	I	Asheville, NC	
	I	Bristol, TN	
	I	Charleston, WV	
	T	Columbus, OH	
44	T	Dallas, TX	327,690
	I	Austin, TX	
	T	San Antonio, TX	

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APPENDIX II

Route configuration	Market designation (note a)	Market entities to be served by surface routes	Computed air cost
45	T	Denver, CO	$ 483,608
	I	Casper, WY	
	T	Billings, MT	
46	T	Denver, CO	400,724
	T	Albuquerque, NM	
47	T	New Orleans, LA	440,144
	I	Houston, TX	
	T	San Antonio, TX	
48	T	Boston, MA	304,481
	I	White River Junction, VT	
	T	Montreal, Canada	
49	T	Denver, CO	470,763
	I	Wichita, KS	
	T	Oklahoma City, OK	
50	T	Minneapolis, MN	221,446
	T	Sioux Falls, SD	
51	T	Baltimore, MD	88,248
	T	Washington, DC (DCA)	
52	T	Buffalo, NY	371,262
	I	Cleveland, OH	
	I	Columbus, OH	
	I	Cincinnati, OH	
	T	Louisville, KY	
53	T	Las Vegas, NV	272,371
	T	Reno, NV	
54	T	Dallas, TX	220,902
	T	Amarillo, TX	
		Total	$72,505,674

a/T equals terminal point, I equals intermediate point, and H equals hub/tansfer point.

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APPENDIX III

THE POSTMASTER GENERAL
Washington, DC 20260-0010

April 23, 1982

Dear Mr. Anderson:

Thank you for the opportunity to comment on your proposed report entitled, "Potential Savings From Diverting Certain Mail From Air to Surface Transportation."

We agree that the methodology jointly developed by the Postal Service and GAO will help us cut costs by identifying routes where mail can be shifted from air to surface transportation without adversely affecting current levels of service.

We have taken steps to implement this methodology on a national basis and have recently acquired a computerized model to assist us.

The aid you have given us in this effort is greatly appreciated.

Sincerely,

William F. Bolger

Mr. William J. Anderson
Director, General
Government Division
U.S. General Accounting Office
Washington, D.C. 20548

(019005)

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